

# Genetic variation, Gene- Environment Interactions and Environmental Risk Assessment

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY



# Why is Genetic Variations Interesting For Chemical Risk Assessment?

- **Basic Science**

- Probe / elucidate molecular pathways
- Use to find gene-disease links in whole animals

- **Applied**

- Understand nature of susceptible populations
  - Natural (e.g. poor metabolizers)
  - Induced (i.e. environmental stress is first and genetic variant is second hit for cancer)
- Use to set conservative exposure thresholds

- Clay Stephens
  - Population Genetic Analysis Techniques for Finding Gene-Environment Interactions
- Richard Weinshilboum
  - Pharmacogenomics: Science and Translation
- Amanda Drake
  - The Epigenetic Determinants of Early Life Programming of Disease